U.S.F.W.S.
Fishery Leaflet
482

HIGH-SEAS FISHERIES OF THE U.S.S.R.

#482
N.P.
C.L.
P.

P. O. F. I. LIBRARY
APR 13 1959
FISH & WILDLIFE SERVICE

Laboratory
NOAA, National Marine Fisheries Service
SWFC Honolulu Laboratory F/SWC2
2570 Dole Street
Honolulu, HI 96822-2398

UNITED STATES DEPARTMENT OF THE INTERIOR

FISH AND WILDLIFE SERVICE

BUREAU OF COMMERCIAL FISHERIES

WASHINGTON 25, D.C.

FISHERY LEAFLET 482

COVER

VIEW OF FACTORY-TRAWLER PUSHKIN. THE VESSEL IS EQUIPPED FOR STERN TRAWLING, CAN HAUL UP TO 10 TONS OF FISH ABOARD THROUGH THE STERN SLIPWAY, AND CAN FREEZE AND PACKAGE THE FISH AT SEA.

UNITED STATES DEPARTMENT OF THE INTERIOR, FRED A. SEATON, SECRETARY
FISH AND WILDLIFE SERVICE, ARNIE J. SUOMELA, COMMISSIONER
BUREAU OF COMMERCIAL FISHERIES, DONALD L. McKERNAN, DIRECTOR

HIGH-SEAS FISHERIES OF THE U.S.S.R.

BY

MORTON J. GARFIELD

COMMODITY-INDUSTRY ANALYST
BRANCH OF SPECIAL REPORTS
DIVISION OF INDUSTRIAL RESEARCH AND SERVICES

FISHERY LEAFLET 482
WASHINGTON 25, D.C.
MARCH 1959

HIGH-SEAS FISHERIES OF THE U.S.S.R.

Contents

	Page
Status and trends	1
Principal high-seas fisheries	4
Arctic- and Baltic-based operations	4
Catch and principal species	4
Fishing ports	7
Far Eastern-based operations	7
Fishing vessels and equipment	10
Foreign trade	13
International activities and research	15
Whaling	16
List of principal sources	17

Tables

Table 1.--Catch of fish and shellfish, by selected species, 1948 and 1953-56

Table 2.--Marine landings at Arctic and Baltic ports, by fishing areas, 1956

Table 3.--Number and type of fishing craft, 1940, 1948, 1953-56

Table 4.--Imports of fishery products by principal countries of origin, 1955-57

Table 5.--Whale production in the Antarctic, 1953-54 to 1956-57

Figures

Figure 1.--Catch of fish and shellfish, by region, 1938, 1948, and 1954-56

Figure 2.--Marine landings of fish and shellfish at Arctic-European and Baltic ports, by area of origin, 1956

Figure 3.--Marine landings of fish and shellfish in Far Eastern territories, 1956

Figure 4.--Number of motorized fishing craft, 1940, 1948, and 1954-56

HIGH-SEAS FISHERIES OF THE U.S.S.R.

STATUS AND TRENDS

The fisheries are a basic industry in the economy of the U.S.S.R., providing the people with an estimated one-third of their total consumption of animal protein. Some reports place the figure as high as 40 percent. In all Soviet five-year plans, the fishing industry has been recognized as an important means of supplying the Soviet Union's increasing population with animal foods. In recent years, moreover, even greater emphasis has been placed on expanding fishery production, probably because livestock production has failed to reach proposed goals. The fishing industry has had a far better record than the livestock industry in approaching planned goals.

The recent expansion of the U.S.S.R.'s fishing industry has been directed mainly toward the high-seas fisheries. Traditional Soviet fisheries have been conducted on a large scale in almost all major inland and coastal-marine waters. These waters, however, are believed to be fully exploited; it has also been reported that, in some lake and river fisheries, catches have been declining because of pollution, hydroelectric projects, and other factors. With long coastlines providing access to the rich fishing grounds of the Arctic, Atlantic, and Pacific Oceans, the Soviets are in a most advantageous position for expanding their high-seas fisheries.

In 1948, the estimated annual Soviet catch of fish and shellfish was about 3.3 billion pounds (figure 1). Since then it has increased by 2.5 billion pounds to about 5.8 billion pounds in 1956. The catch from fresh waters has remained static at about 1.5 billion pounds annually; the high-seas fisheries for bottom fishes (principally cod, flatfishes, and redfish) and herring have accounted for most of the increased marine catch (table 1). About 75 percent of the total U.S.S.R. catch now comes from the marine fisheries, compared with about 55 percent in 1948.

The Soviet Union also has a large whaling industry. In 1956, Soviet production of whale oil from the Antarctic and other areas totaled about 93,000,000 pounds, or 6.7 percent of world production.

In less than a decade -- from 1948 to 1956 -- the number of motorized craft in the Soviet fishing fleet increased nearly fourfold. New trawlers and seiners of large tonnage have been mainly responsible for the rapid increase in U.S.S.R. fishery landings. Also, large factory or mother ships have been utilized intensively in the Soviet fisheries; these craft can process the catch and service the fishing fleet in distant waters and in areas where port and other facilities

have not kept pace with fishery developments. High-seas fishing operations will undoubtedly be intensified and probably extended even farther than Newfoundland waters where the Russians have been operating since 1956.

Before the recent technological progress of Soviet fisheries, the catch was distributed predominantly as salted products. In the past decade, processing facilities on land have been expanded and modernized, and equipment for the freezing of fish and the reduction of fish

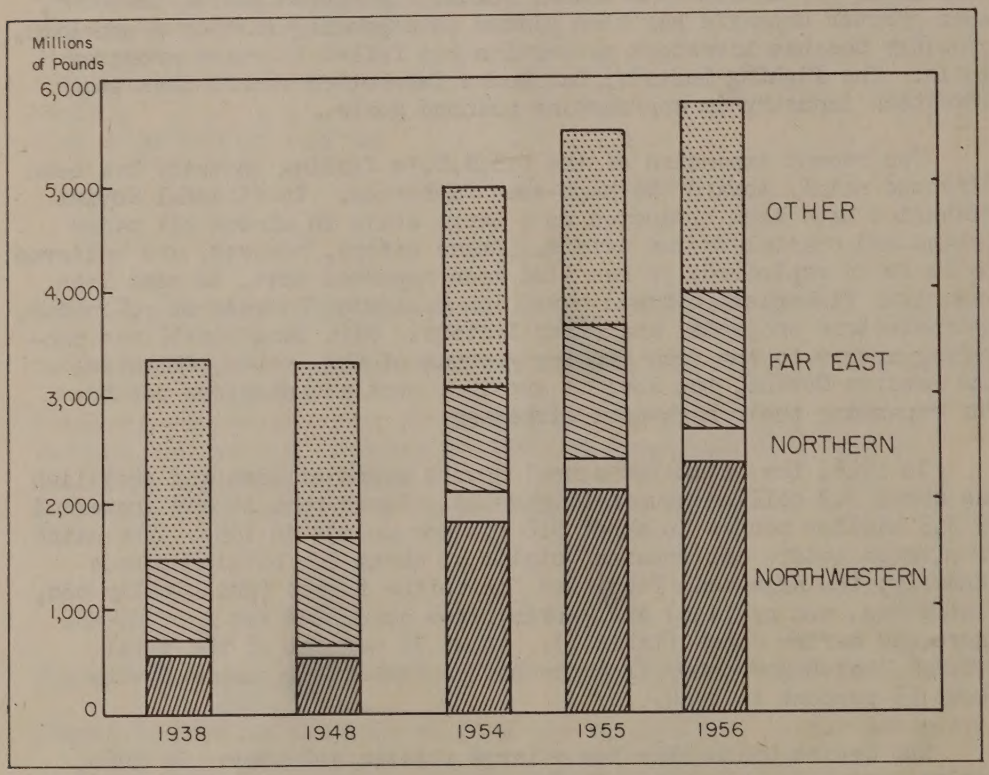

FIGURE 1.--U.S.S.R: CATCH OF FISH AND SHELLFISH, BY REGION, 1938, 1948, AND 1954-56

to meal has been installed on trawlers. Each year larger amounts of the catch are frozen or canned, but the quantities salted remain large, in part due to market demand and in part to the uneven development of fisheries in some areas. In the Far East, especially, more facilities are needed for unloading, processing, and distributing the enlarged catch of an expanded fleet.

Soviet plans propose fishery landings of 9.3 billion pounds in 1960 (including whales), and 11.0 billion pounds by 1975. With the

vigorous application of modern technology and biology to its fishing industry, it seems likely that the U.S.S.R. will be capable of eventual fulfillment of these ambitious production goals. Moreover, the U.S.S.R. can invest in its fisheries without regard to returns, in contrast with free economies where profit is the paramount objective. Large-scale expenditures have been made by the U.S.S.R. for vessels, equipment, and fishery research. Costs and earnings of Soviet fishing enterprises are considered in allocating funds, but these factors need not be decisive in an economy in which wages and prices can be administered according to national plans and policies.

The state-controlled economy of the U.S.S.R. manages all aspects of the fishing industry. From Moscow, the Ministry of Fish Industry provides overall direction to the fishing activities of about 300,000 fishermen and 200,000 processing workers. Regional state trusts control fishing and processing collectives (kolkhozes). The trusts also administer units responsible for constructing vessels and processing plants, manufacturing fishing gear, producing materials for packaging

TABLE 1.--U.S.S.R: CATCH OF FISH AND SHELLFISH, BY SELECTED SPECIES, 1948 AND 1953-56

(IN MILLIONS OF POUNDS)

SPECIES	1948	1953	1954	1955	1956
MARINE					
COD AND ALLIED SPECIES	563.7	751.8	1,319.0	1,533.7	1,625.5
HERRING					
ATLANTIC	15.0	266.7	384.0	494.7	610.7
BALTIC	44.8	141.5	189.4	188.7	187.0
PACIFIC	257.0	376.8	274.5	299.6	339.9
TOTAL HERRING	316.8	785.0	847.9	983.0	1,137.6
SALMON, PACIFIC	295.0	420.6	268.3	380.1	367.3
FLATFISHES	87.1	140.2	173.3	280.4	339.7
REDFISHES (ROCKFISH, OCEAN PERCH)	32.2	49.4	71.6	69.7	99.2
KING CRAB	32.0	62.6	81.6	82.5	79.6
OTHER MARINE	527.9	913.4	715.5	609.8	663.9
TOTAL MARINE	1,854.7	3,123.0	3,477.2	3,939.2	4,312.8
FRESH WATER[1/]	1,419.1	1,248.7	1,500.7	1,561.3	1,454.4
GRAND TOTAL	3,273.8	4,371.7	4,977.9	5,500.5	5,767.2

1/ PRINCIPALLY ROACH, BREAM, CARP, PIKE, PIKE-PERCH, AND WHITEFISHES.

DATA FROM SOURCE 7.

fishery products, and marketing the catch. A large Soviet fishery research and management program includes about 50 organizations employing thousands of scientists. The All-Union Scientific-Research Institute of Marine Fisheries and Oceanography alone has a staff of 500. Fishery technicians are trained in 5 higher educational institutes and in 22 specialized secondary schools.

PRINCIPAL HIGH-SEAS FISHERIES

The U.S.S.R.'s catch of marine and fresh-water species is reported by numerous territorial units, which can be combined into the following major regions: (1) Northwestern, (2) Northern, (3) Far Eastern, and (4) other. The category "other" consists of marine and fresh-water catches from the Black Sea, Sea of Azov, rivers, and such inland bodies of water as the Caspian and Aral Seas and Lakes Balkhash and Baikal. Since this report is concerned only with the high-seas fisheries, no attempt has been made to segregate "other" into its many component units. As far as is known, high-seas fisheries are conducted only from the Northwestern, Northern, and Far Eastern Regions.

The largest expansion in fishery production has been in the Northwestern Region (figure 1), which includes the Baltic republics (Lithuania, Latvia, and Estonia), the Kola Peninsula on the Barents and White Seas, and those parts of the Russian Soviet Federal Socialist Republic (R.S.F.S.R.) that border on the Baltic Sea. The principal Soviet high-seas fishing port, Murmansk, is located on the Kola Peninsula. The Northern Region extends along the Arctic coast from the eastern shore of the White Sea to the border of European and Soviet Asia. The Far Eastern Region includes all R.S.F.S.R. areas bordering the Pacific Ocean, Sea of Okhotsk, and Bering Sea.

The most striking developments in the U.S.S.R. high-seas fisheries have been in the Arctic, North Atlantic, and adjacent seas and in North Pacific waters. The fisheries which are conducted in the Northern and Northwestern Regions accounted for about 46 percent of the total U.S.S.R. catch in 1956. The Far Eastern Region ranked next, accounting for about 23 percent of the catch. Together the three regions accounted for a catch of about 4.0 billion pounds in 1956, compared to 1.6 billion pounds in 1948. Only a small part of these regional catches (probably about 60,000,000 pounds) consists of fresh-water species. Most of the landings at European-Arctic ports are cod, herring, and redfish; Baltic landings are mainly herring. Off Soviet Asia, the seas of the North Pacific provide valuable catches of salmon, herring, flatfishes, king crab, and other species.

Arctic- and Baltic-based Operations

Catch and principal species. -- In 1956, fishing operations from European-Arctic and Baltic bases in the Northern and Northwestern

TABLE 2.--U.S.S.R: MARINE LANDINGS AT ARCTIC AND BALTIC PORTS, BY FISHING AREAS, 1956

FISHING AREA	CATCH		U.S.S.R. SHARE OF CATCH BY ALL COUNTRIES
	1,000 POUNDS	PERCENT	PERCENT
BARENTS SEA	1,400,334	53.5	58.8
NORWEGIAN SEA	455,618	17.4	14.6
BALTIC SEA	394,413	15.1	45.4
SPITZBERGEN AND BEAR ISLAND	199,994	7.6	28.4
FAROESE GROUNDS	63,428	2.5	27.8
NORTH SEA	63,249	2.4	1.4
NEWFOUNDLAND	37,738	1.4	9.3
OTHER	3,102	0.1	-
TOTAL	2,617,876	100.0	-

DATA FROM SOURCE 5.

Regions of the U.S.S.R. caught 2.6 billion pounds of marine fish and shellfish (table 2 and figure 2). The catch was taken principally from the Barents, Norwegian, and Baltic Seas, but major catches were also made as far west as the Grand Banks off Newfoundland.

About two-thirds of the landings by the Soviet's Arctic- and Baltic-based fisheries consist of cod and other bottom fishes; the rest is made up almost entirely of the pelagic herring. Soviet trawlers, fishing mainly on the banks off Murmansk and northern Norway and around Spitzbergen and Bear Island, catch more bottom fishes than any other European country. Among European countries, the Soviet catch of herring is second only to that of Norway. Most of the herring is taken with drift-gill nets by vessels operating in the Norwegian Sea and adjacent waters. In 1956, the principal species caught by Soviet craft based at European-Arctic and Baltic ports were as follows:

Species	Catch 1,000 pounds
Cod (including some haddock and coalfish)	1,519,881
Herring	798,839
Redfish	91,232
Other	207,924
Total	2,617,876

Intensified trawling in the Barents Sea has been associated with

a decline in stocks of cod. Although the Soviets attribute the decline to such hydrological features as changes in water temperatures, U.S.S.R. and Norwegian fishery officials met in 1958 to discuss conservation measures. The Soviets believe coastal waters are overfished, but they have annually renewed the agreement permitting British trawlers to fish up to three miles of the coast in the Barents and White Seas. Fishermen of other countries must observe the 12-mile territorial limit declared by the U.S.S.R. and cannot fish in the White Sea.

In 1956, trawlers of the U.S.S.R. began operating off the coast of Newfoundland and caught 38,000,000 pounds of fish. Operations were rapidly expanded and almost 110,000,000 pounds were caught in 1957. Most of the catch was taken on the Flemish Cap grounds, and the rest (42,000,000 pounds) on the Grand Banks. On these fishing grounds the Soviets reportedly operated trawlers and factory ships. The large trawlers (each over 600 gross tons) usually fish in deeper waters than the craft of other countries, and areas of operations are

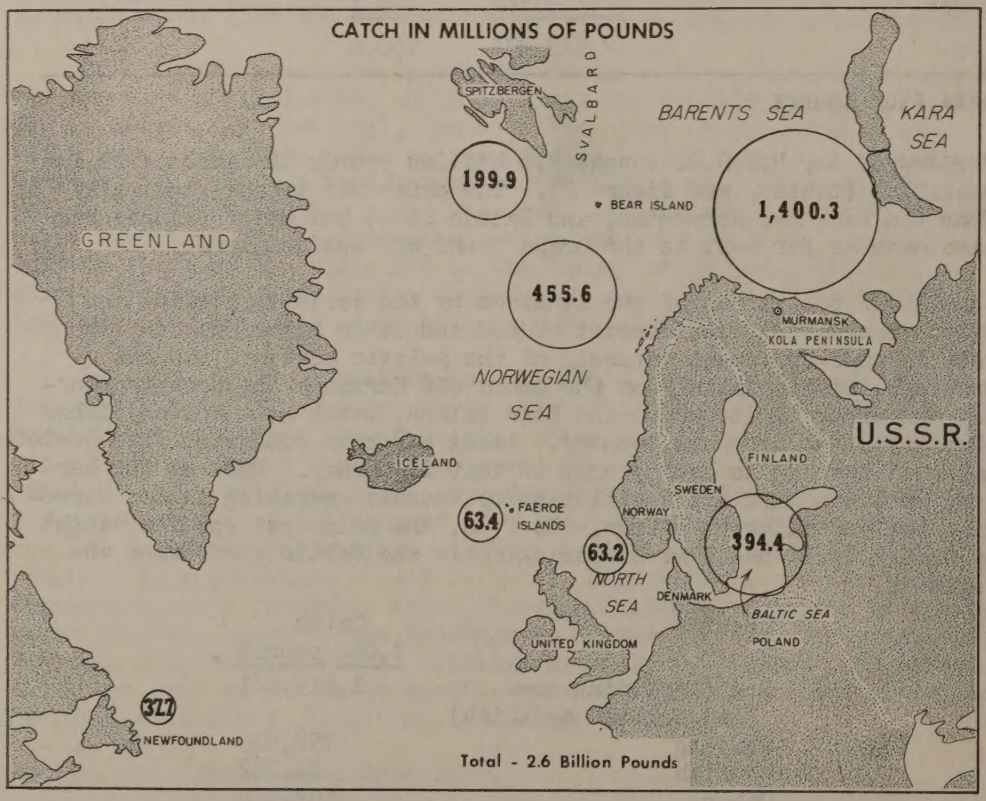

FIGURE 2.--U.S.S.R: MARINE LANDINGS OF FISH AND SHELLFISH AT ARCTIC-EUROPEAN AND BALTIC PORTS, BY AREA OF ORIGIN, 1956

easily spotted by buoys flying small Soviet flags. The buoys used to mark the fishing grounds enable the fishermen to cover a given area more efficiently.

As in the Arctic-based fisheries, recent expansion in the Baltic-based fisheries has been accomplished through large-scale fishing operations. Mother-ship fleets out of Kaliningrad have been operating in the North Atlantic for herring and for bottom fish.

In the herring fishery, it has been reported that in 1958 the U.S.S.R. operated about 8 mother ships and 200 to 300 catcher vessels in the North Sea and in the North Atlantic. The main base for the mother ships was in the vicinity of the Faeroe Islands. The herring were salted aboard the catcher boats and then transferred to the mother ships which also serve as supply depots. The Soviet herring catch has been increasing while the British catch has fallen off.

The highly organized Soviet fisheries have probably gathered more data on herring migrations than have been gathered by any other nation. The Soviet herring fleets are operated under rigid control and intensive research is conducted during all operations. Through detailed analysis of biological information, the fleets can be efficiently directed to large schools of herring.

Fishing ports. -- Fisheries north of the Arctic Circle are based mainly in the ice-free port of Murmansk on the Barents Sea. Other fishing ports, such as Archangel and Kandalaksha on the White Sea and Naryan-Mar on the Kara Sea, are icebound about six months of each year. It has been suggested that the trawler fleet based at Archangel be expanded in order to relieve congestion at Murmansk during the summer season. Moreover, Archangel is closer to marketing and supply centers.

In view of the problems of shore facilities at Arctic bases and the distance to fishing grounds in the North Atlantic, more fishing vessels are being based in Kaliningrad and other Baltic ports. Although Murmansk retains first place in catches of bottom fish, Baltic ports have exceeded it in landings of herring. In 1956, about two-thirds of the herring catch was landed at Baltic ports. Being close to population centers, these ports are also expected to receive larger catches of bottom fishes as Soviet trawler fleets expand operations off Greenland, Newfoundland, and other areas of the Northwest Atlantic. In these areas, prospects for cod, redfish, and other bottom fishes are excellent. Although farther from home port than vessels of other countries, Soviet fishing vessels are refueled at sea by mother ships, permitting them to occupy choice fishing grounds for long periods.

Far Eastern-based Operations

The Far East is the U.S.S.R.'s second most important region for

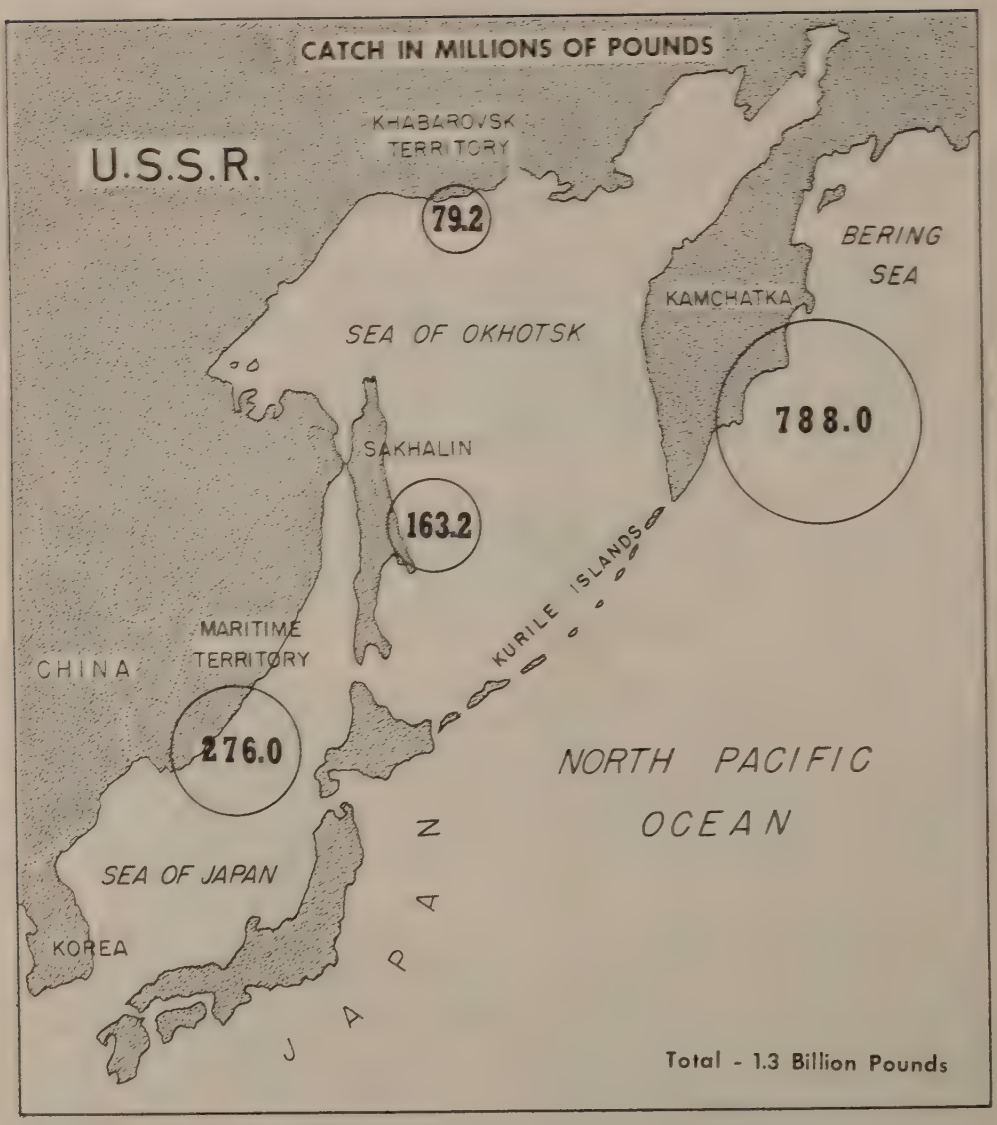

FIGURE 3.--U.S.S.R: MARINE LANDINGS OF FISH AND SHELLFISH IN FAR EASTERN TERRITORIES, 1956

fish production, with a catch of 1.3 billion pounds in 1956 (figure 3). The leading and most promising fish-producing centers in Soviet Asia are on Kamchatka. About 60 percent of the Far Eastern catch has been made by Kamchatkan-based fishermen.

Fishery production in the Far East has fallen short of official goals. Soviet Far Eastern fisheries have been hampered mainly by

(1) the great distances to population centers, (2) inadequate transport facilities, (3) fluctuations in the stocks of salmon and king crab, and (4) deficiencies in supplies, manpower, and processing equipment.

The Far Eastern catch consists largely of herring, salmon, and crab. However, the North Pacific and its arms -- the Bering, Okhotsk, and Japan Seas -- are also rich in many other species which are not fished intensively, such as Alaska pollock. Herring ranks first in quantity taken, but salmon species are of higher value. In 1957, the principal species taken were as follows:

Species	Catch 1,000 pounds
Pacific herring	653,655
Pink salmon	235,230
Chum salmon	71,429
Other salmon	25,794
King crab	65,696
Total	1,051,804

Part of the large trawler fleet based in the Far East lies idle for two-thirds of the year. The lost time is attributed to inadequacies in ports and other facilities. Because of these shortcomings, Kamchatka-based trawlers, each capable of catching 750 to 1,500 metric tons of fish annually, average less than 500 tons each. Other problems of the Kamchatkan fisheries, as reported by the Soviet press, are inadequate supplies of salmon and poor utilization of the catch, with resultant waste. Loss incurred from spoilage after the fish are landed is a serious problem throughout the Far Eastern fisheries.

Soviet fishery expansion in the Far East has been largely through enforced contraction of Japanese operations in the region. As a result of World War II, Japan lost important fishing bases in Kamchatka, South Sakhalin, and the Kuriles; the U.S.S.R. has made no provision for the reestablishment of the traditional leases or "lots" for Japanese salmon and crab fishing based in Soviet territory.

In 1956, the Soviet Union restricted Japanese high-seas fishing in the Northwest Pacific by unilaterally establishing a Salmon Fishing Control Line. Shortly after, a U.S.S.R.-Japanese Convention was drawn up regulating North Pacific fishing. This treaty has not been ratified, but an annual quota on the Japanese high-seas salmon catch is established each year. In 1958, the quota for Japanese salmon fishing in the treaty area was 110,000 metric tons (242,506,000 pounds), of which 91,667 tons were allocated to factory-ship fleets and the rest to drift-net boats. In that year, the catch within the treaty area was 110,145 metric tons; this plus the catch south of the treaty area yielded a total Japanese salmon catch of 181,854 tons

(100,915,000 pounds). The Soviet salmon catch in 1958 dropped to only 73,000 metric tons (160,936,000 pounds), reportedly the lowest in 25 years. In 1959, the Soviet Union is expected to demand that the Japanese factory-ship quota be reduced to 60,000 metric tons (132,276,000 pounds) of salmon in the area covered by the agreement; also the Soviets are expected to close the Sea of Okhotsk to Japanese salmon fishermen.

To meet production quotas, Soviet Far Eastern fishermen have been expanding their activities southward into waters heretofore exploited only by the Japanese. The Japanese have observed Soviet vessels fishing for saury off Shikotan Island (in the southern Kuriles) and off eastern Hokkaido. The Japanese are concerned about the effect of large-scale Soviet exploitation on the saury stocks. Present Japanese regulations governing this high-seas fishery may be ineffective and an agreement with the U.S.S.R. may be necessary to conserve the saury. The Japanese have also noted, with concern, the strong interest of visiting Russians in Japanese tuna-fishing techniques.

In 1958, the U.S.S.R. and Japan signed a crab-fishing agreement. Japan agreed to limit production of its factory ships operating off the west coast of Kamchatka to 320,000 cases of crabmeat. The U.S.S.R. fleet was given a quota of 480,000 cases. The Japanese fleet met its 1958 production quota, but the Soviet fleet produced only 340,000 cases because of poor catches.

FISHING VESSELS AND EQUIPMENT

The great strides made by the Soviet fisheries have been largely through the development of a productive modern fishing fleet. Trawlers, seiners, and factory ships of large capacity have been built. Some of the trawlers are over 200 feet in length, with a capacity of about 500 metric tons (1,100,000 pounds) of fish. The factory-ship fleets can remain at sea for long periods, thereby reducing the amount of uneconomic traveling time to and from the fishing grounds. Recent five-year plans have stressed expansion and mechanization of the fleet, with the introduction of such modern features as stern-trawling equipment, freezers, and echo sounders. Success of the building program is indicated by the growth of the motorized fleet from 3,158 vessels in 1948 to 12,387 in 1956 (table 3 and figure 4). More recent information is not available, but expansion is undoubtedly continuing. In 1958, the Soviets reportedly planned an additional 125 large trawlers and 16 factory-trawlers equipped to freeze fish and to produce fishmeal.

The U.S.S.R.'s fleet of trawlers has expanded from only 107 vessels in 1940 to 1,785 in 1956. Efficiency has been increased as well; the average annual catch of each trawler operating in the

TABLE 3.--U.S.S.R: NUMBER AND TYPE OF FISHING CRAFT, 1940, 1948, AND 1953-56

FISHING CRAFT	1940	1948	1953	1954	1955	1956
MOTORIZED						
TRAWLERS	107	329	1,184	1,379	1,598	1,785
SEINERS	376	407	1,221	1,395	1,517	1,724
OTHER	2,244	2,422	5,898	7,151	7,757	8,878
TOTAL MOTORIZED	2,727	3,158	8,303	9,925	10,872	12,387
NONMOTORIZED	33,679	41,174	46,292	45,912	47,752	48,056
TOTAL	36,406	44,332	54,595	55,837	58,624	60,443

DATA FROM SOURCE 7.

Barents Sea went from 975 metric tons (2,149,000 pounds) in 1945 to 1,825 (4,023,000 pounds) in 1955. In addition to standard-type trawlers (many over 160 feet in length), it is believed that the Soviets operate the largest fleet of factory-trawlers and factory ships in the world. The three main types of vessels used in the Russian trawl fisheries are:

(1) Standard distant-water trawlers, mostly 600 to 700 gross tons in size.

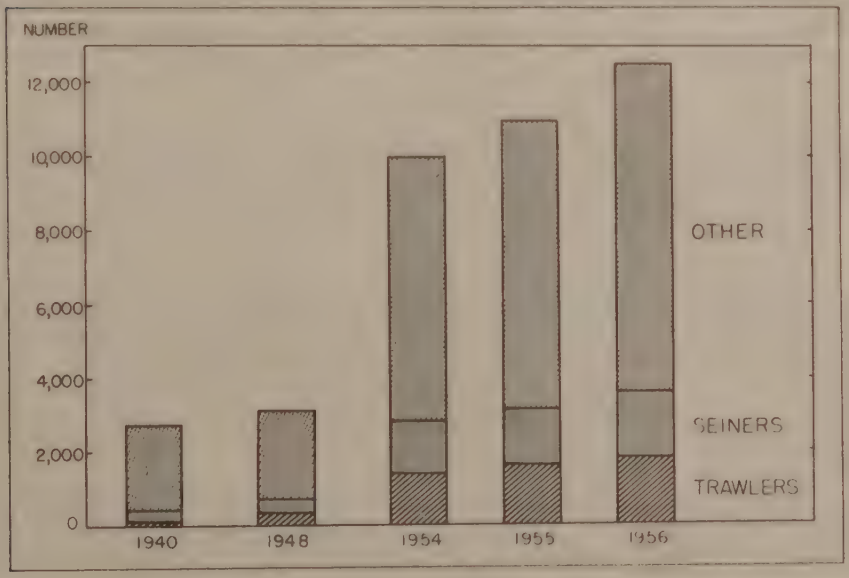

FIGURE 4.--U.S.S.R: NUMBER OF MOTORIZED FISHING CRAFT, 1940, 1948, AND 1954-56

(2) Factory-trawlers of 2,500 gross tons; these include 24 Pushkin-type stern trawling vessels, similar to the British Fairtry. This class of vessel has refrigerated fish holds of 500 to 800 metric tons capacity, fishmeal storage, and fish-oil tanks.

(3) Factory and mother ships of 8,000 to 12,000 gross tons that work with a group of small trawlers or other fishing craft; these ships are much larger than factory-trawlers and are not equipped with fishing gear.

In 1958, two large factory-trawlers were launched at Leningrad. These vessels are improved versions of the factory-trawler Pushkin, which was the prototype of 25 such large trawlers built since 1954 in West Germany for the Soviet Union. This new type of factory-trawler has an overall length of 278 feet and a gross tonnage of 3,712. The vessels, equipped for stern trawling, can haul aboard up to 10 tons of fish, can be operated in rough seas, and can freeze and package the catch. Manned by a crew of 102 men, the vessel can remain at sea for 60 days, permitting operations off Newfoundland, Greenland, and other points more distant from home ports.

Domestic shipyards have been unable to construct vessels as rapidly as required by the expansion program, and the Soviet Union has been ordering many large fishing vessels from foreign shipyards. The Russians have also benefited from foreign experience in constructing and equipping fishing vessels. Many trawlers of advanced design and with fish-freezing equipment have been purchased from European shipyards, especially those in Great Britain, West Germany, Poland, and Sweden. In 1958, launchings of several Soviet-ordered craft were reported in Poland. The last of 20 trawlers purchased from British shipyards was delivered; the trawlers are almost 190 feet in overall length with a displacement, when loaded, of 1,300 tons. A Polish shipyard recently completed a large mother ship which contains five refrigeration compartments, a drying chamber, and huge fuel tanks; the ship is also equipped with a helicopter for scouting fish. All of these ships have reinforced hulls designed for Arctic operations.

The Soviet fishing fleet has about 300 vessels with fish-freezing equipment; these vessels include large trawlers, factory ships, and nonpowered barges. In 1957, the total capacity of refrigerated holds was almost 180,000 metric tons; shore-storage capacity was 150,000 tons. By 1965, the Russians plan to freeze nearly 2 billion pounds of fish at sea annually, equivalent to about twice the New England catch.

In the handling of fish at sea through the application of modern refrigeration methods, the U.S.S.R. is reportedly at least as advanced as Western countries. Daily capacity for freezing fish at sea

increased from 330 metric tons in 1950 to 2,000 tons in 1957. Research is continuing on improvement of equipment used for freezing fish at sea and on land. Two refrigeration methods are used on trawlers -- brine immersion freezing or air-blast freezing. The air-blast method is now preferred to brine freezing because an even temperature can be maintained on the surface of the fish, and personnel avoid skin irritations which may be caused by contact with brined fish.

Plans are underway to construct a large factory ship that will service herring seiners. During each trip of three months duration, two production lines on this proposed factory ship will be able to pack about 40,000 barrels of herring.

In the Far East, stern-operated trawls have been developed for use on multiple-purpose vessels, also used as purse seiners. This additional gear promotes year-round production from the seiners that operate off the western coast of Kamchatka and the northern Kuriles. The small 23-meter trawls are worked on soft ground in shallow (3 to 5 fathoms) waters.

Part of the success of Soviet high-seas fishing is attributable to the widespread use of exploratory or scouting vessels and aircraft. In 1956, eleven vessels were used for spotting fish in the Far Eastern waters, but the Russian industry reported that this number was inadequate. More craft were needed to avoid time-consuming searches by the fleet for fish schools. Migrating fish are also located and tracked by low-flying helicopters trailing echo-sounding devices. The airborne equipment is faster and is considered more accurate than ship-based echo-sounding or ranging instruments, which are affected by the vessel's movements, especially in rough seas.

FOREIGN TRADE

Despite increased domestic production from the Soviet high-seas fisheries, substantial quantities of salted herring continue to be imported from Norway, Iceland, the Netherlands, Denmark, and the United Kingdom, and frozen fish fillets from Iceland and Norway (table 4). Foreign trade in fishery products, however, accounts for a relatively small part of the total fish supply. Government-controlled imports of fishery products are designed to secure supplementary supplies of frozen fillets and the relatively low-priced salted herring, and to promote political goals.

During 1955-57, the volume of Soviet imports of fishery products was at a relatively high level. This trade, however, may fluctuate sharply, depending on the political situation and the completion of trade agreements. The U.S.S.R. Ministry of Foreign Trade, through its subsidiary government corporation Prodintorg (Foreign Trade in

TABLE 4.--U.S.S.R: IMPORTS OF FISHERY PRODUCTS BY PRINCIPAL COUNTRIES OF ORIGIN, 1955-57

(IN THOUSANDS OF POUNDS)

COUNTRY OF ORIGIN AND COMMODITY	1955	1956	1957
NORWAY			
FROZEN FISH	6,614	17,636	17,857
SALTED HERRING	114,417	121,913	72,310
TOTAL	121,031	139,549	90,167
ICELAND			
FROZEN FISH	55,555	61,728	69,444
SALTED HERRING	19,180	35,494	35,714
TOTAL	74,735	97,222	105,158
NETHERLANDS			
SALTED HERRING	28,659	9,480	22,266
UNITED KINGDOM			
SALTED HERRING	16,975	10,361	7,937
DENMARK			
SALTED HERRING	5,071	9,259	14,550
OTHER	11,023	12,566	28,659
TOTAL	257,494	278,437	268,737

DATA FROM SOURCE 8.

Foodstuffs), arranges with foreign governments for the export or import of fishery products. In recent years, expenditures for fishery imports have exceeded receipts from fishery exports by the equivalent of about $4,000,000 to $6,000,000. For example, in 1957, fishery imports were valued at $24,655,000 and exports at $18,693,000.

Since 1955, the Soviet Union has imported large quantities of frozen fish fillets and salted herring from Iceland. In 1952, the Soviet Bloc accounted for about 7 percent of Iceland's foreign trade; by 1957, this figure had increased to approximately 34 percent. In 1958, Icelandic shipments of frozen fish to the U.S.S.R. reportedly declined to about 55,000,000 pounds from the 69,444,000 pounds of the previous year. Iceland has been shipping a larger volume of fishery products to the U.S. market, where recent prices have been more favorable than those received for bulk shipments to the U.S.S.R. Moreover, U.S. dollars can be freely used to purchase a wide variety of goods. During 1958, however, the Soviet Union made a large long-term loan to Iceland for the purchase of fishing vessels. Iceland will repay the

loan mainly through foreign exchange gained from fishery exports to the Soviet Union and its satellites.

Soviet fishery exports are small in quantity but high in value, and bolster foreign trade receipts from non-Communist countries. The most valuable fishery exports -- canned crabmeat, canned salmon, and caviar -- are products of Soviet Asia. Most of these exports are shipped to the United Kingdom and other countries of Western Europe. Exports to the United States are negligible; moreover, there is an American embargo on Soviet canned crabmeat because forced or penal labor has been used in its production.

INTERNATIONAL ACTIVITIES AND RESEARCH

The U.S.S.R. has recently increased its participation in international fishery commissions. In 1958, the Soviets joined the International Convention adopted by 16 nations of Northern Europe to conserve fish stocks in the eastern part of the North Atlantic and in the North Sea. Russian fishermen are now required to abide by the mesh-size limits and other regulations of the Convention. The Baltic Sea, however, is excluded from the Convention area, as are all Soviet territorial waters and some Arctic seas. Soviet fishery research is planned on the herring grounds in the Norwegian Sea in cooperation with Norway, Denmark, and Iceland.

In 1957, the Soviet Union became a member of the International Commission of the Northwest Atlantic Fisheries and is bound to adhere to its conservation measures governing cod and haddock. Three Russian trawlers, with scientific equipment, are participating in the research program conducted in the conservation area covered by this Commission.

In 1956, the U.S.S.R. and the other countries in the Sino-Soviet Bloc (Communist China, North Korea, and North Vietnam) organized the Commission for Research in Fisheries in the Western Pacific. To increase fishery production the Commission has planned marine research in the Japan, Yellow, and East China Seas. The members also exchange information on fish culture.

Soviet fishery research in the Atlantic has been extended to tropical waters to investigate the possibilities for commercial fishing. In 1957, under the direction of the All-Union Scientific-Research Institute of Marine Fisheries and Oceanography, a trawler, a seiner, and a refrigerated vessel explored the stocks of tuna, sardines, mackerel, and other species found in the tropical area of the Atlantic Ocean. The sardines taken were frozen and later canned in Russia. As the product was well received, several vessels may be sent to exploit this sardine resource on a large scale. Dakar, French West Africa, has reportedly been used as a base for operations.

WHALING

The Soviet Union conducts whaling operations in the Antarctic and off the Kurile Islands and Kamchatka. Large quantities of whale oil are produced, as well as lesser amounts of fertilizer, meat, and biologicals; production has not varied markedly since the 1953-54 season (table 5). However, plans have been developed by the Soviets to greatly increase their participation in Antarctic whaling. In the 1955-56 season, U.S.S.R. whale-oil production amounted to 6.7 percent of the world total; U.S.S.R. whale-oil output, by areas, was as follows:

Area	Quantity 1,000 pounds
Antarctic	57,617
Kurile Islands	20,331
Kamchatka	15,205
Total	93,153

The U.S.S.R. was one of seven countries that sent whaling fleets to the Antarctic during the 1956-57 season. The Soviet whaling fleet consisted of the factory ship Slava accompanied by 24 catcher boats for killing whales. A considerably larger factory ship, the 46,000-gross-ton Sovetskaya Ukraina, was recently launched. Outfitting of this new 714-foot-long vessel will delay its participation in Antarctic whaling until the 1959-60 season. Construction of two more whale

TABLE 5.--U.S.S.R: WHALE PRODUCTION IN THE ANTARCTIC, 1953-54 TO 1956-57

(IN THOUSANDS OF POUNDS, EXCEPT AS INDICATED)

PRODUCT	1953-54	1954-55	1955-56	1956-57
OIL	63,381	64,495	57,617	51,609
MEAL	3,649	4,299	4,526	5,536
LIVER	(1)	1,234	1,391	1,192
MEAT	(1)	1,124	1,113	(1)
OTHER BYPRODUCTS	917	7	(1)	(1)
TOTAL	67,947	71,159	64,647	58,337
WHALES CAUGHT (NUMBER)	3,086	3,290	2,773	2,600

1/ NOT AVAILABLE.

NOTE: THE ANTARCTIC SEASON USUALLY OPENS IN NOVEMBER OR DECEMBER AND MOST OF THE CATCH IS MADE IN THE LATEST YEAR LISTED FOR EACH SEASON.

DATA FROM SOURCE 6.

factory ships is included in the current seven-year plan; whaling equipment for these ships has reportedly been ordered from a Hamburg (West Germany) company.

The Soviet Union is a member of the International Whaling Convention, but it does not adhere necessarily to the regulations that are approved annually by a majority of the members. International observers are not allowed aboard Soviet whaling ships; commercial whaling interests have little doubt that U.S.S.R. whalers take all the whales within reach, regardless of size or the annual quota set by the International Commission. The U.S.S.R.'s plan to enlarge its Antarctic operations threatens to break down the Whaling Convention. Increased competition for the limited whale resources would result in curtailment of operations by other whaling nations already faced with higher costs and lower prices for whale oil. Norway, the principal whaling nation, has threatened to withdraw from the International Whaling Convention.

Soviet whaling activities in the Far East are conducted off Kamchatka from the factory ship Aleut (5,055 gross tons) and its fleet of 6 catcher boats. Coastal land-based operations are conducted by four shore stations in the Kurile Islands; 15 catcher boats are being used. The stations were formerly operated by the Japanese. Unlike the Antarctic catch, which consists mainly of baleen whales, the Far Eastern catch consists mainly of sperm whales.

LIST OF PRINCIPAL SOURCES

1. Anonymous. "Achievements of Far Eastern Fishermen," The Current Digest of the Soviet Press. Vol. 8, no. 52. New York: The Joint Committee on Slavic Studies. 1957.

2. -----. "Problems of Further Development of the Fishing Industry," Planovoe Khoziaistvo (Industry Planning). January 1956. Moscow.

3. -----. "Prospects of Growth of the Fishing Industry of the U.S.S.R.," Rybnoye Khoziaistvo (The Fishing Industry). January 1958. Moscow.

4. -----. "Russian Methods of Freezing Fish at Sea," Fishing News. September 26, 1958. London.

5. Conseil Permanent International pour l'Exploration de la Mer (Permanent International Council for the Study of the Sea). Bulletin Statistique des Pêches Maritimes (Statistical Bulletin of the Marine Fisheries). Vol. 41, 1956. Copenhagen: Andr. Fred Høst & Fils. 1958.

6. The Committee for Whaling Statistics. International Whaling Statistics. Vol. 39. Oslo, Norway. 1958.

7. United Nations. Food and Agriculture Organization. Yearbook of Fishery Statistics, 1955-56 and 1957. Rome.

8. U.S.S.R. Ministry of Foreign Trade. Foreign Trade of the U.S.S.R. for 1957. Statistical Survey. Planning-Economic Administration. Moscow. 1958.

9. Zartzev, V. P., and Pavlov, E. G. "Fish Freezing on Board Ships in the U.S.S.R." International Refrigeration Meeting. Moscow. 1958.

INT.-DUP. SEC., WASH., D.C. 51607